REMARKS

This is intended as a full and complete response to the Final Office Action dated September 9, 2003, having a shortened statutory period for response set to expire on December 9, 2003. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-4, 7, 8, 10, 12, 13, 23, and 26-30 remain pending in the application and are shown above. Claims 1-4, 7, 8, 10, 12, 13, 23, and 26-30 are rejected. Reconsideration of the rejected claims is requested for reasons presented below.

Claims 1-4, 7-8, 10, 12-13, 23, and 26-30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Werkhoven, et al.* (U.S Patent Publication No. 2001/0041250), in view of *Jurmann* (U.S. Patent No. 5,167,735), on grounds that it would have been obvious to use nitrogen or argon as a purge gas, as described in *Jurmann*, with hydrogen or helium as the carrier gas in the process of *Werkhoven, et al.* Applicants respectfully traverse the rejection.

Jurmann provides a process for de-oxidizing steel in an oxygen-free chamber before it is annealed in an annealing furnace. *Jurmann* teaches that an essentially oxygen-free de-oxidizing chamber is provided by purging the chamber with nitrogen or argon because nitrogen and argon are inert, relatively trouble-free and inexpensive gases (column 2, lines 39-43). *Jurmann* also states that the annealing in the furnace may be performed in a hydrogen gas atmosphere (column 1, lines 63-68). However, *Jurmann* does not teach or suggest a process in which a purge gas and a carrier gas having differing constituents are used in a processing chamber. The de-oxidizing and annealing process of *Jurmann* does not use carrier gases.

Werkhoven, et al. describes depositing thin films in a chamber by an atomic layer deposition process that uses a purge gas and a carrier gas in addition to compounds that deposit a material on a substrate. *Werkhoven, et al.* describes purging the chamber by continuing the flow of the carrier gas (paragraph 65). *Werkhoven, et al.* provides hydrogen, nitrogen, argon, and helium as possible carrier gases.

There is no suggestion or motivation in the combined teaching of *Jurmann* and *Werkhoven, et al.* to purge a chamber with a purge gas that has differing constituents

from the carrier gas used to introduce the compounds that are chemisorbed onto the substrate. Thus, Applicants submit that the combination of *Jurmann*, which describes argon or nitrogen gases as purge gases in a process that does not use carrier gases or deposit a layer on a substrate, with *Werkhoven, et al.*, which describes the deposition of a layer on a substrate by introducing compounds into a chamber with a carrier gas and purging the chamber with a purge gas that is identical to the carrier gas, does not teach or motivate the deposition of a layer on a substrate by introducing compounds into a chamber with a carrier gas and purging the chamber with a purge gas that has differing constituents than the carrier gas.

Therefore, *Werkhoven, et al.* in view of *Jurmann* does not teach, show, or suggest a method for forming a layer on a substrate disposed in a processing chamber, said method comprising chemisorbing onto said substrate alternating monolayers of a first compound and a second compound, with said second compound having fluorine atoms associated therewith, with each of said first and second compounds being introduced into said processing chamber along with a carrier gas, purging said processing chamber following chemisorption of each of the alternating monolayers, wherein the purging said processing chamber includes introducing a purge gas therein, and controlling a quantity of said fluorine atoms associated with the monolayer of said second compound as a function of said carrier gas, wherein the purge gas and the carrier gas have differing constituents, as recited in claim 1. Applicants respectfully request withdrawal of the rejection of claim 1, and of claims 2-4, 7-8, and 26-27, which depend thereon.

Furthermore, *Werkhoven, et al.* in view of *Jurmann* does not teach, show, or suggest a method for forming a layer on a substrate disposed in a processing chamber, said method comprising serially exposing said substrate to first and second reactive gases, with said first reactive gas having a first compound associated therewith and said second reactive gas having a second compound associated therewith, to form alternating monolayers of said first compound and said second compound, with said second compound having fluorine atoms associated therewith, controlling a quantity of said fluorine atoms associated with the monolayer of said second compound by introducing into said processing chamber a carrier gas along with said first and second

reactive gases, and purging said processing chamber following chemisorption of each of the alternating monolayers by introducing a purge gas, wherein the purge gas and the carrier gas have differing constituents, as recited in claim 10. Applicants respectfully request withdrawal of the rejection of claim 10 and of claims 12-13 and 28-29, which depend thereon.

Applicants further submit that there is no suggestion or motivation in the combination of *Werkhoven, et al.* and *Jurmann* to use hydrogen as a carrier gas and a purge gas that has differing constituents than the carrier gas, as there is no suggestion in *Werkhoven, et al.* and *Jurmann* individually or in combination to use a purge gas with differing constituents from a carrier gas in a deposition process. Thus, *Werkhoven, et al.* in view of *Jurmann* does not teach, show, or suggest a method for forming a layer on a substrate disposed in a processing chamber, said method comprising serially exposing said substrate to first and second reactive gases to deposit monolayers on the substrate, with said first reactive gas having fluorine atoms associated therewith, controlling a quantity of said fluorine atoms associated with the monolayers by introducing into said processing chamber hydrogen (H_2) as a carrier gas along with said first and second reactive gases, and purging said processing chamber following deposition of each of the monolayers by introducing a purge gas, wherein the purge gas and the carrier gas have differing constituents, as recited in claim 23. Applicants respectfully request withdrawal of the rejection of claim 23 and of claim 30, which depends thereon.

Applicants further traverse the rejection of dependent claims 26-30 on grounds that *Werkhoven, et al.* in view of *Jurmann* does not teach the recited combinations of purge gas and carrier gas as asserted by the Examiner. Applicants further submit that there is no suggestion or motivation in the combination of *Werkhoven, et al.* and *Jurmann* to use nitrogen or argon as a purge gas and hydrogen or helium as a carrier gas as asserted by the Examiner, as there is no suggestion in *Werkhoven, et al.* and *Jurmann* individually or in combination to use a purge gas with differing constituents from a carrier gas in a deposition process. *Jurmann* teaches argon and nitrogen as purge gases but does not describe carrier gases. *Werkhoven, et al.* teaches hydrogen, nitrogen, argon, and helium as carrier gases and using the chosen carrier gas as the

purge gas. *Werkhoven, et al.* and *Jurmann* individually or in combination do not teach or suggest a process with a purge gas of argon and a carrier gas of nitrogen, as recited in claims 26 and 28. *Werkhoven, et al.* and *Jurmann* individually or in combination do not teach or suggest a process with a purge gas of argon and a carrier gas of hydrogen, as recited in claims 27, 29, and 30. Withdrawal of the rejections of claims 26-30 is respectfully requested.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the Final Office Action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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